CHINA 2020: Medical Devices Sector

Today’s Corporate Platforms – Competitive or Obsolete for Tomorrow’s World?

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Managing Director
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Preface: China Strategic Market Considerations

Strategic Marketing Considerations

Market Access
- The China market is highly fragmented and requires MD companies to provide products that can be tailored to a broad range of specific nuanced needs. There exists an increasing demand for higher quality products, of a quality that lies between local and imported products. Price remains a key determinant to success in China.

M&A / Joint Ventures
- Domestic China firms have a major advantage over foreign players, particularly as a means to accessing the China market; business contacts, tailored products, local knowledge – and, perhaps most importantly, knowledge of complex local regulations.
- Acquiring the right local company or forming a joint venture can give foreign firms an major advantage in gaining access and awareness of MD products to its customers.

Regulatory Challenges
- Sales permit approvals can take up to 12+ months and can hinder the ability to access the China marketplace.
- Furthermore, each and every product sold into China requires both a production license and a sales license issued by the SFDA; and, these licenses have expiration dates.

Distribution
- More than 160,000 distributors exist in China creating a highly fragmented environment for manufactures to access sales opportunities.
- No distributor in China has nationwide access and suppliers must work with many distributors to get broad yet effective coverage.
- Distributor due-diligence for foreign firms is a necessary step in order to gain access.

Risks
- Dubious false advertising and marketing practices stating inflated claims have been monitored and cracked down on.
- Reimbursement list of medical insurance; if treatment or exam is not listed the demand for specific product will drop significantly.
Medical Devices Primed for Growth

Life Science Industry Segments
(2009 – 2012 growth forecast)

USD (billions)

Biological Products
Medical Device
Chemical Product
TCM
API
Medical Supplies
Prepared Herbal Slices

Market Size
Market Growth (2010 - 2012f)

0%
5%
10%
15%
20%
25%
30%
35%

0
5
10
15
20
25
30
35
40
45
50

14.5
30%

Source: CLSA Asia Pacific Markets
Preface: Trends in Medical Devices M&A / Joint-Venture Activity

Recent Medical Devices M&A / Joint Venture Activity

2010

Chindex recently formed an alliance with Shanghai’s Fosun Pharmaceutical. The Joint Venture agreement will form Chindex Medical Limited and focus on manufacturing and distributing medical devices in China.

2009

The Shanghai based Sym-Bio life science company, a supplier of diagnostic instruments was acquired by PerkinElmer for approximately USD 63.6 million.

2008

Medtronic acquired a 15% equity interest in Weigao Group Medical Polymer to market therapies in the spine and orthopedics sector. The agreement Gave Medtronic a 51% interest and Weigao a 49% interest.
**Recent Medical Devices M&A / Joint Venture Activity**

**2008**

GE Healthcare established a Joint Venture agreement with China’s Shinva Medical Instrument Co. and will focused on the manufacturing of x-ray equipment.

**2008**

Philips acquires Shenzhen Goldway to help strengthen its high-end patient monitoring business segment in China.

**2004**

Neusoft and Philips formed a manufacturing and R&D Joint Venture for medical systems. The Agreement formed Philips-Neusoft Medical Systems to develop CT and x-ray equipment.

Source: Public Websites
Preface: Trends in Medical Devices PRC Research & Development Activity

Foreign & Domestic Medical Devices R&D Operations

Research & Development Centers

Source: Company and Public Websites
### Preface: China Undergoing Major Healthcare and Insurance Reform

**USD130 billion Investment**

<table>
<thead>
<tr>
<th>Healthcare and Insurance Reform (2009 – 2011)</th>
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<tbody>
<tr>
<td>♦ <strong>Basic Medical Security (Insurance)</strong></td>
</tr>
<tr>
<td>- Reduce drug expenses and medical access to urban and rural residents</td>
</tr>
<tr>
<td>- Individual subsidy goes from RMB60 to RMB120 starting in 2010</td>
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<tr>
<td>♦ <strong>Improve Healthcare Services at the Grass-Roots Level</strong></td>
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<td>- Focus on establishing 2,000 provincial level hospitals and complete 29,000 township clinics and 5,000 clinics in remote villages</td>
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<td>- Reform public hospital administration, operations and supervision to improve service quality</td>
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### Preface: Large-Scale Construction of New Healthcare Institutions

#### Construction and Renovation of 50,000+ Medical Institutions

#### Construction of Healthcare Institutions

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Hospitals</td>
<td>20,291</td>
<td>+ 2,000</td>
</tr>
<tr>
<td>Health Service Center for Community</td>
<td>27,308</td>
<td>+ 17,100</td>
</tr>
<tr>
<td>Health Centers (Rural)</td>
<td>39,627</td>
<td>+ 29,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outpatient Departments</td>
<td>7,639</td>
<td>n/a</td>
</tr>
<tr>
<td>Clinics</td>
<td>174,809</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>907,249</strong></td>
<td>+ 53,100</td>
</tr>
</tbody>
</table>

ren* = renovations

Source: Ministry of Health, National Development and Reform Commission
Preface: Market Size Forecasted to 2014

2014 Market Value Forecasted @ USD 25 BILLION

Medical Devices Market Value
(2005 – 2014f)

USD (billion)


0 5 10 15 20 25 30

8.8 16 25
Medical Devices Primed for Growth across Major Sub-Segments

- **Dental**
  - (Dental Implants)
- **Orthopedics**
  - (Implants, Supports)
- **Consumables**
  - (Syringes, Catheters)
- **Diagnostic Imaging**
  - (X-ray Machines, MRI)
- **Other**
  - (ECG, Incubators, Ventilators, Heart-Lung Machines)

**Preface:** Market Size of Medical Devices Industry Sub-Segments
Corporate Trends: Structural Optimization – Markets, Resources, Innovation
Today’s Burning Platform: *Global* Markets, Cost Reduction, Innovation

**Market Access/Revenue Growth ... Global Structural’ Cost Reduction**

### 1. Markets

#### DRIVING

- Shareholder Value
- Markets / Revenues
- Resources / Cost Reduction
- Innovation / Knowledge
- Efficiency / Shared Services

### 2. Resources

- IT
- Procure
- Engineering
- Production /Assembly
- Distribution
- Sourcing
- R&D
- Sales
- Service

### 3. Knowledge

- EFFICIENCY
- TODAY'S BURNING PLATFORM: Global Markets, Cost Reduction, Innovation
1. Market Drivers: Growth Drivers for the Bio-Pharma Sector

WEALTH + AGING POPULATION + LIFESTYLE/DISEASE + HEALTHCARE REFORM + INSURANCE REFORM

- **Middle Class/ Income Growth**
  - More than 100 million people join China’s middle class every 5 years.

- **Aging Population**
  - Over-65 age segment: growing most rapidly (2 to 2.4 ppa), expected to reach 111 million by 2010.
  - 55+ age group: to increase by 42% in next ten years; 0-14 age segment: to decrease by 8%.

- **Lifestyle Changes**
  - Lifestyle-related disease accelerating -- e.g. obesity, diabetes, cardiovascular, chronic respiratory diseases.
  - China will have 38 million diabetic patients by 2025, almost double projections of diabetes for the US.
  - 1/3 of world’s smokers are Chinese.

- **Healthcare Reform**
  - USD130 billion is being spent on medical sector reform over the three years spanning 2009 to 2011.

- **Insurance Reform**
  - Insurance coverage for urban dwellers has increased 10-fold in past 10 years.
  - Nearly all of China’s 1.3 billion population covered by some form of insurance by 2012.
1.1 Income Growth: World Bank Projects China as #1 Economy

**2020 GDP***

- **China**: $29.6 tr
- **US**: $28.8 tr
- **India**: $13.4 tr
- **Japan**: $6.8 tr
- **EU-27**: $30.0 tr

**2009 GDP***

- **US**: $14.1 tr
- **China**: $9.1 tr
- **Japan**: $4.1 tr
- **India**: $3.8 tr
- **EU-27**: $14.2 tr
1.1 Income Growth: Forward Trend in Exploding Middle Class

China’s Middle Class: 400 million (2010) ... 500 million (2015)

Middle Class Income Bands for Urban Population

Urban Household Income (US$ – PPP-Adjusted)
- Global > US$107,800
- Affluent US$3,800 - 107,800
- Upper Middle US$21,501 – 53,900
- Lower Middle US$13,500 – 21,500
- Poor < US$13,500

Urban Population (millions)
- 2005: 531
- 2010F: 607
- 2015F: 684
- 2020F: 756
- 2025F: 822

Urban Household Income
- Global > US$107,800
- Affluent US$3,800 - 107,800
- Upper Middle US$21,501 – 53,900
- Lower Middle US$13,500 – 21,500
- Poor < US$13,500

Sources: Urbanization Rates, Population based on UN, World Urbanization Prospects 2007; MGI Consumer Demand 2008
1.1 Income Growth: Significant Income Stratification across China

Coastal Wealth Spreading Across the Country

China Per Capita Annual Income (USD, PPP-Adjusted)

<table>
<thead>
<tr>
<th>Per Capita Annual Income (USD, PPP-Adjusted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 40,000</td>
</tr>
<tr>
<td>30,000 - 40,000</td>
</tr>
<tr>
<td>25,000 - 30,000</td>
</tr>
<tr>
<td>20,000 - 25,000</td>
</tr>
<tr>
<td>17,500 - 20,000</td>
</tr>
<tr>
<td>0 - 17,500</td>
</tr>
</tbody>
</table>

Per Capita Annual Income (USD, PPP-Adjusted)
**1.1 Income Growth:** Healthcare Expenditure Per Capita Trend

Healthcare Expenditure Per Capita Continues to Grow

Healthcare Expenditure Per Capita
(2005 – 2020f)

- **249% Increase**

USD per Capita

- **2005**
- **2006**
- **2007**
- **2008**
- **2009**
- **2010**
- **Future**
- **2020**

Source: PWC, Prof. Wen Tiejun, Renmin University of China
1.2 Aging Population: Aging Population … One-Child Policy

87 MM 65+ Yeal Old in 2000 … 112 MM in 2010 … 340 MM in 2050

Population under 14 Years Old
(% of Total Population)

Population over 65 Years Old
(% of Total Population)

Source: Dr. Jean-Paul Rodrigue; Exolus
### 1.3 Lifestyle Changes: Wealth tied to Disease Accelerating Activities

**Disease Acceleration**

**Lifestyle Changes**

- 1/3 of world’s smokers are Chinese

- Lifestyle-related disease accelerating -- e.g., obesity, diabetes, cardiovascular, chronic respiratory diseases

- China will have 38 million diabetic patients by 2025, almost double projections of diabetes for the US

- No established culture of health consciousness and fitness

Source: Dr. Jean-Paul Rodrigue
1.4 Healthcare Reform: Undergoing Major Healthcare Reform

USD130 billion Investment

China Healthcare Reform
(2009 – 2011)

- **Improve Healthcare Services at the Grass-Roots Level**
  - Focus on establishing 2,000 provincial level hospitals and complete 29,000 township clinics and 5,000 clinics in remote villages
  - Construction and training at the township, community, and village levels

- **Construct Preliminary National Essential Medicine System**
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- **Basic Public Health Services**
  - Citizens (urban & rural) disease prevention awareness programs
  - Gradually provide equal public health services in both rural and urban areas

- **Public Hospital Reform Pilot Projects**
  - Reform public hospital administration, operations and supervision to improve service quality

Source: Ministry of Health, National Development and Reform Commission
## 1.5 Insurance Reform: Programming to Universal Coverage by 2012

### 8-Fold Increase in Insurance Coverage in 10 Years ... Coverage for Nearly All by 2012

### China Insurance Reform

<table>
<thead>
<tr>
<th>Insurance Program</th>
<th>Description</th>
<th>1998</th>
<th>2008</th>
<th>2012f</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Basic Medical Insurance (BMI)</td>
<td>• Urban Scheme</td>
<td>25 million</td>
<td>200 million</td>
<td>300 million</td>
</tr>
<tr>
<td></td>
<td>• Contributions from both Employers and Employees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Urban Cooperative Medical Scheme (UCMS)</td>
<td>• Program for Urban Residents not Covered under BMI</td>
<td>n/a</td>
<td>100 million</td>
<td>250 million</td>
</tr>
<tr>
<td>• New Rural Partnership Healthcare System (RPHS)</td>
<td>• Coverage for Rural Residents</td>
<td>n/a</td>
<td>800 million</td>
<td>800 million</td>
</tr>
<tr>
<td></td>
<td>• Low Coverage</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Population Covered by Insurance           | 25 million | 1.1 billion | 1.35 billion |

Note: 'n/a' indicates not applicable.
2. Costs: First-World Infrastructure with Third-World Wages Exist?

Asia Labor Costs: 10 – 20 Times Cheaper than in West

**Labor Costs**
(USD per month)

- **US**: 2,250
- **Singapore**: 1,590
- **Philippines**: 190
- **Thailand**: 160
- **China**: 120
- **Vietnam**: 100

**Utility Costs**

- **Electrical /kwh**
- **Water /m3**
- **Sewer /m3**

Note: Units for Electricity $/kWh; Water in USD/m3; Waste Water in USD/m3

Source: Wage Data from the International Labor Organization; Utilities Rates from Public Utilities (non-negotiated rates)
Low Cost Bands + Emerging Mega-Cities + High-Income Geographies

Opportunities: Where are Future Optimal Investment Envelopes?

Per Capita Annual Income (USD, PPP-Adjusted)
- > 40,000
- 30,000 - 40,000
- 25,000 - 30,000
- 20,000 - 25,000
- 17,500 - 20,000
- 0 - 17,500

Per Capita Income / Wage Band Overlay

Wage Bands
Mega-City
Mega-Corridors
3. Innovation: Where are Key Nodes for Structuring R&D Platforms?

"R" of R&D Seeks MD Clusters ... "D" Seeks Hospitals & Production

R&D Centers (# Operations)
- > 10
- > 50
- > 150

Research & Development Centers
(Number of Operations in Select Cities)

Wage Bands
Mega-Cluster
Mega-Corridors

Source: UNCTAD, WIR
Foreign Medical Devices R&D Operational Largely in YRD and Bohai Rim

R&D Centers (# Operations)
- > 10
- > 50
- > 150

Wage Bands
- Mega-Cluster
- Mega-Corridors

Foreign MD R&D Centers in the PRC

Source: UNCTAD, WIR
3. Innovation: Big Pharma also Migrating R&D Functions to China

Foreign Life Sciences R&D Operational Largely in YRD and Bohai Rim

- Foreign Life Sciences R&D Centers in the PRC

Illustrative Innovation Trend Based on Big Pharma R&D Investment

Source: UNCTAD, WIR
3. Innovation: Driving Creation of a National Innovation System

19% YoY Increase in Research Spend for past Decade ... RMB460 billion Total

China National Innovation System

1. Institutions that Drive Innovation
   - CAS
   - CAE
   - MOST
   - NSFC
   - NDRC
   - MOE
   - MOF
   - MOC

2. Programs, Initiatives, Processes for Innovation
   - Government Programs
     - 863 Program
     - 973 Program
     - 211 Program
     - 985 Program
     - NSFC Funding
     - National Key Technology R&D

3. Academia, Firms, People that Drive Innovation
   - Academia
   - Private Firms

4. Intermediaries / Aggregators of Innovation
   - Hi-Tech Development Zone (HTDZ)
   - Science Parks
   - Incubators
   - Natural Clusters

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Source: CCCPC
### Core Programs Supporting R&D in China

<table>
<thead>
<tr>
<th>Program</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>863 Program</strong></td>
<td>The National High-tech R&amp;D Development Program promotes applied research and accelerating high tech development.</td>
</tr>
<tr>
<td></td>
<td>Priority Projects – Involve research in 19 key areas of development: 19 research fields including IT, biotechnology and advanced agricultural technology, advanced materials technology, advanced manufacturing and automation technology, energy technology and etc.</td>
</tr>
<tr>
<td></td>
<td>Key Projects – Started in 1986, projects are centered around significant high tech issues that align with the countries strategies.</td>
</tr>
<tr>
<td><strong>National 973 Program</strong></td>
<td>The National Basic Research Program commenced in 1993 and is implemented by MOST, and the National Science Foundation. The program focuses on agriculture, energy, information, resources and environment, population and health and materials. A significant amount of projects include international cooperation.</td>
</tr>
<tr>
<td><strong>National Key Technologies Program</strong></td>
<td>Commencement took place in 1982 as the first S&amp;T initiative. Research has a key focus on improving living standards through technological advances in the following areas: agriculture, information technology, environmental protection, medicine and public welfare technologies.</td>
</tr>
</tbody>
</table>
### 3. Innovation: Programs Created to Undergird National Innovation System

#### Ministry of Education (MOE) Programs for R&D

**Core Programs Supporting R&D in China**

<table>
<thead>
<tr>
<th>Program 211</th>
<th>Launched by the government in 1993, the program calls for scientific research and administrative efficiency of higher education institutions. The plan also coordinated to build 100 higher education institutions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program 985</td>
<td>39 universities commenced in 1998 to revitalize select institutions to become world class with intensive funding; estimated at RMB 30 billion ie. Peking university and Tsinghua University. Currently there are approximately 39 universities involved in the program. The National Natural Science Foundation of China (NSFC) is guided by the state council and funds research initiatives.</td>
</tr>
<tr>
<td>Natural Science Foundation Fund</td>
<td>Created in 1986, that funds basic research in universities and research institutes; 2007 fund totalled RMB 4.3 billion. The program has 53,000 Chinese scholars from universities and research institutes to review applicants.</td>
</tr>
<tr>
<td>General Program</td>
<td>Open to all natural science disciplines and projects are financed for 3 years. Grants average around RMB 247,000. In 2005, approximately 9,000 applicants were approved out of 49,000</td>
</tr>
<tr>
<td>Key Program</td>
<td>Supports creative and in-depth research projects. The duration for each project is 4 years. Among 1,330 applications in 2005, 290 were funded and the average funding was RMB 1.59 million.</td>
</tr>
<tr>
<td>Major Research</td>
<td>Only 12 projects have been financed since 2000.</td>
</tr>
</tbody>
</table>
China’s Economic Health … Report Card
Senior Executives Select China as Most Attractive in World

Investor Confidence in China #1 in World

Top 14 Most Attractive Destinations for Future Investment
(2009 – 2011)

Foreign Investment Continues to Soar – Strong Vote of Confidence

Record FDI of USD106 billion in 2010

Foreign Direct Investment Inflows
(1990 – 2010)

USD

Source: China Statistical Yearbook
Healthy Balance Sheets – Banks, Enterprises, Households

USD2.85 trillion in Foreign Reserves ... Insulation of Financial System ... Clean Balance Sheets

- **China’s Financial System Healthy, Benefits from Insulation, Abundant Liquidity**
  - China banks cleaned up in 1990s: Non-performing loans in 1997 averaged 40 – 50%; only 6% in 2007.
  - Financial institutions extended approximately USD1.4 tr in new loans in 2009; almost double that of 2008; and USD1.2 tr in 2010, slightly down from 2009.

- **Forex Reserves Achieve Record High in 2010: USD 2.85 trillion**
  - The Central Bank has accumulated over USD 2.85 trillion in foreign reserves.
  - The accumulation of large external surpluses means financial system enjoys abundant liquidity.

- **Clean Balance Sheets for Enterprises and Households**
  - State Owned Enterprise net profits as share of GDP has grown from (-1%) in 1997 to (+4.3%) in 2007.
  - Record corporate profit growth over past 5 years (industrial profits rose 38 ppa); liability ratios declined.
  - Urban incomes have nearly doubled in past 10 years.

Source: Deutsche Bank; Standard Chartered; UBS; IMF; Other
Global Expansion Strategy & Cross-Border Investment Execution  
(Greenfield, M&A, Joint Ventures, Outsourcing)

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